Course Approval Form

For approval of new courses and deletions or modifications to an existing course.

registrar.gmu.edu/facultystaff/curriculum

Action Requested:

[x] Create new course [ ] Delete existing course

[ ] Modify existing course (check all that apply)

[ ] Title [ ] Credits [ ] Repeat Status [ ] Grade Type

[ ] Prereq/coreq [ ] Schedule Type [ ] Restrictions

[ ] Other: _____

Course Level:

[x] Undergraduate

[ ] Graduate

College/School: COS **Department:** SPACS

Submitted by: Phil Rubin **Ext:** 3815 **Email:** prubin@gmu.edu

Subject Code: PHYS **Number:** 301

(Do not list multiple codes or numbers. Each course proposal must have a separate form.)

Effective Term: [x] Fall [ ] Spring [ ] Summer Year 2014

Title: Current

Banner (30 characters max including spaces) Analytical Methods of Physics

New Analytical Methods of Physics

Credits: (check one) [x] Fixed [ ] Variable 3 or to

Repeat Status: (check one) [x] Not Repeatable (NR) [ ] Repeatable within degree (RD) [ ] Repeatable within term (RT) Maximum credits allowed:

Grade Mode: (check one) [x] Regular (A, B, C, etc.) [ ] Satisfactory/No Credit [ ] Special (A, B C, etc. +IP)

Schedule Type Code(s): (check all that apply) [x] Lecture (LEC) [ ] Lab (LAB) [ ] Recitation (RCT) [ ] Internship (INT) [ ] Independent Study (IND) [ ] Seminar (SEM) [ ] Studio (STU)

Prerequisite(s): MATH 214

Corequisite(s):

Instructional Mode:

[x] 100% face-to-face

[ ] Hybrid: ≤ 50% electronically delivered

[ ] 100% electronically delivered

Special Instructions: (list restrictions for major, college, or degree;hard-coding; etc.)

Are there equivalent course(s)? [x] Yes [ ] No

If yes, please list MATH 313, 314, 413

Catalog Copy for NEW Courses Only (Consult University Catalog for models)

Description (No more than 60 words, use verb phrases and present tense)	**Notes** (List additional information for the course)
Analytical methods in the Physical Sciences. Provides a comprehensive introduction to the areas of mathematical physics.	

Indicate number of contact hours: Hours of Lecture or Seminar per week: 3 Hours of Lab or Studio: 0

When Offered: (check all that apply) [x] Fall [ ] Summer [x] Spring

Approval Signatures

Department Approval Date

College/School Approval Date

If this course includes subject matter currently dealt with by any other units, the originating department must circulate this proposal for review by those units and obtain the necessary signatures prior to submission. Failure to do so will delay action on this proposal.

Unit Name	Unit Approval Name	Unit Approver's Signature	Date

For Graduate Courses Only

Graduate Council Member	Provost Office	Graduate Council Approval Date

For Registrar Office's Use Only: Banner_____Catalog_____ *revised 2/2/10*

Course Proposal Submitted to the Curriculum Committee of the College of Science

1. COURSE NUMBER AND TITLE:

PHYS 301: Analytical Methods of Physics

Course Prerequisites: MATH 214

Catalog Description: Analytical methods in the Physical Sciences. Provides a comprehensive introduction to the areas of mathematical physics.

2. COURSE JUSTIFICATION:

Course Objectives:

To provide a working knowledge of fundamental analytical methods in physics

Course Necessity:

The Physics B.S. now requires MATH 313 for the major, but it does not present all the topics deemed essential to, and found lacking in, the physics major.

Course Relationship to Existing Programs:

The Physics B.S. now requires MATH 313 for the major, but this course does not present all the topics deemed essential to, and found lacking in, the physics major. The catalog entry for MATH 313 lists the following topics: Vector differential calculus, vector integral calculus, Fourier analysis, and complex analysis. Fourier analysis, for example, is not at present taught in the course, however.

Course Relationship to Existing Courses:

This is a one-semester course introducing techniques—deemed essential for a physics degree—now requiring two or three semesters in MATH 313/413 and 314.

3. APPROVAL HISTORY:

4. SCHEDULING AND PROPOSED INSTRUCTORS:

Semester of Initial Offering: Fall 2014

Proposed Instructors: Barreto, Mishin, Oerter, Rubin, Weingartner, Zhao

5. TENTATIVE SYLLABUS: See attached.

Syllabus
Physics 301 – Analytical Methods of Physics

INSTRUCTOR
OFFICE HOURS
ROOM
TELEPHONE NUMBER

- All e-mail communication from the instructor concerning this course will be to GMU accounts only.
- If you are a student with a disability and you need academic accommodation, please see the instructor and contact the Office of Disability Resources at 703.993.2474. All academic accommodations must be arranged through that office.

Textbook: *Mathematical Methods in the Physical Sciences,* Mary L. Boas

Topics:

- Infinite, Taylor, and Power Series
- Complex numbers
- Partial Differentiation
- Multiple Integration
- Fourier Series and Transformations
- Calculus of Variations
- Tensor Analysis
- Special Functions
- Series Solutions of Differential Equations
- Partial Differential Equations
- Complex Functions
- Integral Equations

Possible Additional Topics:

- Group Theory
- Perturbation Theory
- Numerical Methods

Grades:	Homework	50%
	2 Mid-Term Exams	30%
	Final Examination	20%

Homework: Simply copying someone else's solution is not acceptable and will be considered an Honor Code violation. Submitted homework must show all steps taken. It is your responsibility to make your approach transparent. When in doubt, include extra steps.

- The GMU Honor Code: `http://www.gmu.edu/catalog/9798/honorcod.html#code`